DOCUMENT RESUME

ED 216 978 SO 014 081

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TITLE Building Curricula When You Don't Have the Answer.
PUB DATE Mar 82
NOTE 17p.; Paper presented at the Annual Meeting of the American Educational Research Association (New York, NY, March 1982).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Administrative Organization; *Curriculum Development; Design; *Educational Strategies; Research; Teacher Effectiveness; *Teaching Methods
IDENTIFIERS *Curriculum Theories; Knowledge

ABSTRACT

When dealing with strategy for curriculum development or instruction in education, there are three possible approaches that the implementors can use to achieve desired goals. These three are the administrative approach, the research approach, and the design approach. The administrative approach relies on power as its authority and coercion to integrate its power network and control its functioning. The research approach uses knowledge as its source of power and relies on communication processes for integration and control. The design approach is based on rights of individuals and conformity as integrating and controlling processes. Teachers must be learners and be willing to use when appropriate any of the three approaches in their teaching strategy. Teachers need to be able to recognize the approach that is being used and see how the approach fits the goals of the curriculum. A good teacher uses all three approaches, selecting the appropriate time to use each approach and to know the reason for that particular choice. (Author/NE)

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BUILDING CURRICULA WHEN YOU DON'T HAVE THE ANSWER

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SP 014 081

Paper presented at the American Educational Research Association annual meeting in New York City, March 1982.

BUILDING CURRICULA WHEN YOU DON'T HAVE THE ANSWER

INTRODUCTION

Education involves people. The quantity of involvment depends upon the educational approach followed. In parallel fashion, organized bodies of knowledge are used in all educational approaches. Again, the quantity of knowledge used varies with the approach taken. Education also involves a structuring or restructuring of peoples' knowledge, skills and attitudes. These structurings and restructurings are viewed as "solutions" within the context of a curriculum.

Nadler (1970) believes we should increase productivity and enhance human dignity at the same time. From an educational point of view Maehr (1976) describes the importance of "continuing motivation," whereby the student will continue activities related to an area outside and after the formal school situation. From a national sample of over 5,000 teenagers in a science education study, Pascarella, Walberg, Junker and Haertel (1981) sumbit empirical data which show that the extent of teacher control, and structuring of classroom activities was negatively associated with "continuing motivation." Teacher control, however, positively associated with science achievement. The literature shows that teacher control or direct instruction raises scores on achievement tests, but when other variables are used as outcome measures such as "continuing motivation" or "academic self concept," we are beginning to see differing results. A smaller study by Waxman and Uguroglu (1981) suggests that direct instruction hinders a student's sense of pride and perceived sense of effort in their school work.

What happens when we are asked to build curricula when the bodies of knowledge do not provide agreed upon answers or educational outcomes? Some curriculum theorists argue that if you don't have goals or objectives in mind,

you are wasting your time. In practice, however, our experience shows that teachers work toward trivial outcomes rather than more important concerns. In business this is known as getting the task done, but defeating the staff.

Other than bluffing, what approach can be used when, in fact, the teacher doesn't have "the answer." The answer means what does the teacher expect the student to produce? There is the "what" of teaching and the "how." The what is the content or curriculum while the how is the instructural method. As the curriculum overlaps and is both the content and the process, confusion can be created regarding an approach that is compatible with both. Often the process and product are not consistently planned or produced.

These ideas have been informally developed by the authors at various universities during the past ten years, but have now been formalized to educational settings following a medical education project. Since the details of that context need not be expanded here, we will only say that an agreeable predetermined solution to the medical education project did not exist. After being thrust into a situation with competing solutions, we developed a unique approach. We believed that the learners could generate more workable solutions to the posed problems than we could, due to their experience with the problems. After interacting, we built something which neither of us had seen before. Although the proposed program seemed elegant, it proved different in its nature from past solutions. Colleagues did not share our enthusiasm during this conceptual stage.

Why were our colleagues seeing our work as tightly structured when we found it quite open? As we analyzed the process of the project, we discovered some of the whys. We believe many parallels exist with a formal school setting and feel compelled to elaborate upon our thinking and present our ideas

for your reactions. If educators benefit from these ideas, ultimately students may too.

AREA OF INVESTIGATION

This elaboration presents three major approaches to educational situations. These approaches are described, with supporting philosophies and examples. Finally we suggest possible benefits to educators by thinking within this framework. The three approaches are labeled; Administrative Approach, Research Approach, and Design Approach. They are identified, defined, and synthesized into a curriculum development system.

Definitions

Each of the three approaches discussed operates from quite different authority bases. The administrative approach relies on power as its authority; the research approach uses knowledge as its source of authority and the design approach is based on rights of individuals as its authority base.

A second distinction among these approaches is their structure. The administrative structure is the centralization of powers; the research structure is the complexity of knowledge; and the design structure is the normative equality of individual rights.

The final definitional stipulation discussed relates to processes of integration and control. The administrative approach relies on coercion to integrate its power network and control its functioning. The research approach relies on communication processes for integration and control, while the design approach is based on conformity as integrating and controlling processes.

An administrative approach secures its authority from the established power base. It is concerned with maintaining the status quo, variously referred to in education as preserving the heritage and transmitting the culture. Administrative goals are often achieved through coercion. Those implementing a research approach begin with knowledge as a medium of exchange. In the eyes of a researcher, people are viewed as data sources. In contrast to these two approaches, the design approach seeks a unique solution. It sees people as idea generators and works toward conformation of a solution.

The second major contrast among these approaches is based on individual rights. In the administrative approach, rights are suppressed. For example, in some schools discipline can be overriding as a goal of the institution and outweigh the educational elements. With research, neither rights nor power are as important as the body of knowledge. Most educators have seen the administrative and research approaches since they dominate the educational setting. Finally, the design approach emphasizes the rights of those in the educational setting, as such it is also important for students to recognize the rights of the teacher.

Issues

Table 1 shows the major tendency of each approach in terms of specific issues. Each column heading identifies an issue: involving people, role of organized knowledge, and how solutions are structured. To explain, the first column indicates that the administrative approach uses people as legitimizers, research involves people as sources of data, while design uses people as idea generators. We do not want to assume that administrators use only an administrative approach, when in fact they use all three approaches. Do not confuse the role of administrator with the administrative approach. What different-

iates the administrative approach is the predominance of the characteristic as posed under each issue.

TABLE 1

Predominant Position of Each Approach on Selected Issues

	ISSUES		
APPROACH	Involving People	Use of Knowledge	Structuring Solutions
Administrative	as legitimizers	use what can readily assert	within the organization structure
Research	as sources of data	investigate exhausively	laws and premises
Design	as idea generators (experts)	use what is needed as useful	contextually unique to the problem

One of the most important columns to teachers is how solutions are structured. In an administrative approach, content and process curriculum solutions are based on the power structure of the school. When the curriculum outcome is unknown, an administrative approach does not provide a means to deal with situations and often applies incomplete methods dealing only with that part of the problem that is known from past history. In the research approach, the participants may recognize that a solution is currently unknown, but often try to proceed to laws and premises that are not individualized to the students, the teachers, the curriculum, the educational materials, or the school setting. In a design approach, the process is unique to the problem. The design approach defines the problem through determining the purposes to be achieved, and thus recognizes and arrives at a unique solution. The solution, however, may not be within the framework of the school as a social organization.

Implications

Relative to curriculum design, two conditions need to be met before learning can be considered effective. The solution selected must be cost effective and, in addition, it must impact favorably upon human values. With an administrative approach, the emphasis is on cost effectiveness and does not necessarily address the human value part of effectiveness. This appears because students are not involved in curriculum planning or teaching methods. Research often creates and disseminates new knowledge regardless of cost or the impact on human values. Design gives prominence to the human values and, in practice, results in a more cost effective solution when the answer is unknown than either of the other two approaches.

Table 2 contrasts the educational implications of these three approaches drawing on the educational views of Morris and Pai, (1976). Their three philosophical bases would be Neo-Thomism, Realism, and Experimentalism respectively. The parallel orientations of curriculum thought identified by Schubert (1981) would be Intellectual Traditionalist, Social Behaviorist and Experientialist as well.

Table 2

Educational Implications of Each Approach

	IMPLICATIONS		
APPROACH	Curriculum Structure	Methods	Outcomes (Purposes)
Administration	intellect & spirit	training the intellect	the educated individual
Research	physical world	master facts and information	transmit settled knowledge
Design	social experience	problem solving	program of development and improvement

The role organized knowledge plays in curriculum development is contingent upon both the certainty of the answers and the bases of authority referred to, that is the believability of the source. When statements are verbalized one can choose to not believe, doubt or believe. Believability has two components; likelihood of knowing the answer, and probability of telling the correct answer if known. Our discussion focused only upon the question of knowing the answer -- the level of certainty of the information.

Table 3 identifies these possibilities. On the left of Table 3, the level of certainty typifies problems, while the believability typifies people.

Table 3

Learning Outcomes

LEVELS OF CERTAINTY	PERSPECTIVE OF INDIVIDUAL		
	Not Believable	Doubtful	Believable
Answer Known	Discipline the Mind	Mastering Facts	Absorbing Ideas
Answer Unknown	Total Rejection	Finding Self	Problem Solving

Believability starts by giving people credit for their thinking, as well as their answer. While rewarding thinking apparently works best in problem solving when the answer is not known, (Experimentalism) it can succeed when absorbing ideas (Idealism) providing students are judged on thinking rather than speed at verbalizing a predetermined answer.

Each of the three comparative philosophies (Neo-Thomism, Realism and Experimentalism) and their corresponding educational methodologies described by Morris and Pai (1976) fits uniquely into this 2 x 3 design. This indicates the sufficiency of this classification for discussing differing applications of each view. The fact that each cell has one entry indicates that these methodologies sample the concept space at this dichotomous level of precision.

Additionally we can identify Realism and absorbing ideas (answer known and believable), Existentialism (answer unknown and doubted), and a non-educational situation of total rejection (answer unknown and not believed.)

Notice the disparity between Research based on Realism and mastery of facts (answers known but doubted) and design-based Experimentalism and problem solving more akin to science (uncertainty with proof.) Mastery of facts while doubting them is synonymous with memorizing, but the learner may have neither absorbed nor synthesized them.

MAJOR ASSERTIONS

A variety of educational approaches needs to be considered because the approach used in selecting and designing learning experiences importantly determines the quantity and quality of results. This is not a startling premise. In fact, it is a standard premise that educators knowingly agree with -- and then often totally ignore in practice.

Secondly, as certainty increases so does the reliance on organized knowledge as an authority base. However as certainty increases the reliance on involving people as a basis of authority lessens.

Thirdly, teachers need to continually change and grow, not merely act as catalysts to the educative processes. Teachers must be learners. In which settings can teachers become learners? This question penetrates the idea of certainty on the part of the teacher. Ellul (1964) puts it quite bluntly when distinguishing between that which is known with certainty, (technology), and that which remains unknown, (madness). From a teaching perspective, it may be closer to madness than one is willing to admit to allow students to interact with knowledge when the answer is unknown. This is at least one plausible

explanation for the disparity between the level of appropriate student interaction professed by Piaget, Dewey, Montessouri, and others, and the level practiced in the classrooms.

Finally, when combining an unknown outcome with teachers as learners, the assertion is that the less the certainty, the less the chance for teachers to become learners. This occurs in part because most curriculum builders are reluctant to trust either the teachers or the students. Consequently, they fall back upon either the administrative approach or the research approach. The administrative actor will exercise power to dictate an answer to a situation. The research player will use past knowledge to make the proposed message credible; while the design approach basically says, "I need help with a solution."

The risks of implementing a design approach can be unsettling initially. Teachers face the problem that the administrators and students often push for other approaches because of familiarity and control. Teachers unions argue against it because unions try to stratify territory. Thus, it can become difficult to bring an unconventional approach together. The current push for local school control by communities fits into a design solution better than the others, but often is not compatible with the administrative and research approaches as practiced by the educational professionals. The success of the design approach or of properly using the administrative and research approach depends upon the predominant approach in operation at the time, as well as the ability of professionals to see the value of and become confident in applying or facilitating the various approaches.

In the 1960's new math presented problem solving as basically a design approach. Teachers, however, used an administrative approach in teaching it

and neither the benefits of traditional nor new math were accomplished. What are the implications from this type of inconsistency? If you seek approval from someone who is in the research mode, consider why? If the person operates strongly in the administrative mode and you are primarily a designer, what compromises need to be addressed? In summary, various approaches are required when a curriculum involves a variety of results. Certainty of answers plays a major part in the bases of authority referenced and in dictating whether teachers actively engage in the learning.

TESTING HYPOTHESES

Examples of the Three Approaches in Curriculum Building

In writing this paper we had a choice. We could give you three examples, one from each of the model sciences: mathematics, physical sciences and social sciences; and portray the administrative, research and design approach respectively. Alternatively we could use a single example using each of the three approaches. We decided the second alternative would better illustrate similarities and differences. However, we ran into difficulty when trying to use a simple math division problem of ten-divided-by-five-equals-two. We realized that most teachers would know what the answer should look like. Does that then exclude these types of problems from either a Research or a Design approach? In other words, if you can simply use an Administrative approach and tell the answer why consider any other approach?

To use a research mode and collect data when the answer is known becomes manipulative -- sometimes called discovery learning. To use a design mode when you have the answer wastes time at best; and forces the teacher to deliberately mislead the class on some pretense, at worst. Does this then exclude all math from the design approach? We think not. In drawing on Nadler's

(1970) engineering research which includes evidence collected on some 570 separate design efforts, he concluded that in each case the design approach equaled or exceeded traditional approaches. It must be recognized that Nadler was referring only to industrial engineering efforts. These were limited to the adequacy of the solutions generated, but not to efficiency-type concerns. These conclusions do indicate that design efforts work at least as well as traditional efforts for solutions, even when the answer is known.

To further explain the simple math example, the teacher knows that ten-divided-by-five-equals-two, and probably has enough credibility to merely tell the students the answer. This would illustrate an administrative approach. The students however may not be able to demonstrate what the answer means, even if they can recall it. Using a research approach the teacher could allow students to manipulate piles of sticks to "discover" the answer.

Recall that an approach is essentially a way of thinking about something. With this in mind, as long as a teacher thinks there is a possibility of finding a better way to teach even straight-forward problems, the design approach may be as appropriate as either the administrative or the research approaches.

For example, the first time any student shows a teacher a solution by repeated subtraction, when the teacher has not previously seen the connection, design happens. Of course these days with new math, repeated subtraction as a way of working division problems has become part of the research or administrative approaches. Alternatively, if the solution is not necessarily the content answer but includes teacher, learner and milieu, then the student's solution demonstrates knowing, but perhaps not within the content format prescribed. That would also be design.

If the teacher simply asks; "How would you divide 10 apples among five students?" a likely response is to let each student have an apple today and another one tomorrow. (Whether the correct answer "two" here refers to apples or to days becomes less clear.) On the other hand the most outspoken student may say; "Me and Johnny will each take five." Herein lies the terror when using a Design Approach. (Is this ten-divided-by-five-equals-two, or ten-divided-by-two-equals-five?) In a prescribed curriculum it makes a large difference.

Even when teachers target their teaching slightly above the mean of the class, some students get the answers quickly, especially the bright ones. With a design approach students are encouraged to continue thinking beyond prescribed answers in either a research or design mode. While these three approaches may be equally appropriate for teaching something as obvious as ten-divided-by-five-equals-two, in areas where neither students nor the teacher know the answer they are not equally effective. Consider the administrative teacher when an answer isn't known. One has a choice of mumbling something incoherent or guessing. The research teacher simply says; "I don't know, but maybe I can find out." The design teacher taps into the group for possible clues and solutions. An individual decides based on the most logical or plausible possibilities. A group on the other hand may lend support to choices or solutions that are not the most plausible in any one person's mind.

CONCLUSIONS

We have stated throughout that teachers must at times become learners. When teachers resort to the mechanical application -- the repetition of what they already know -- burnout can result. Teachers become bored and often assert that students today are not what they used to be. They may have become

less enthusiastic and have stopped learning. The proportion of tasks one needs to complete versus the new information, skills and attitudes one seeks to acquire rests with the individual. If we accept, however, that learning is as necessary a part of teaching as teaching, then we propose that a design approach helps that learning.

If a school administrator continually uses a research or administrative approach, teachers can see whether their efforts match with the administrator. Often a teacher becomes frustrated because of using one approach instead of another in a given situation. When should each approach be used? You do not need a design approach for all situations, but at a minimum, need to recognize the approach that is being used. As a teacher, see how the approach fits the goals of the curriculum. You may realize that another approach could be more useful.

Why do students have such a difficult time thinking about new solutions? We believe they seldom practice the art. We are not proposing that a subject-centered curriculum be totally replaced, that teachers never present content to students, or that teachers refrain from giving answers. We propose that teachers recognize problem solving efforts by students. At times a teacher needs to choose not to use the research or administrative approach. Administrators also need to try other models or approaches. Any good teacher acts as an administrator, as a researcher, and as a designer. In fact, any social actor should be able to use multiple approaches. More importantly, one should select the appropriate time to use each approach and especially know the reasons for that particular choice.

Strategy for curriculum then centers upon how one links various approaches as thinking modes together. Educators skilled with each of the

approaches examined here can appreciate the potential of each when appropriately used. If one seriously considers the teacher as an active learner as well, then we have the diversity needed for both curriculum and instruction within education. This diversity becomes critical when an answer is not known with a high degree of certainty.

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